

# **Southern Forest Resource Assessment**



**Report by the  
Tennessee Forestry Commission  
February 2004**

# Executive Summary

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Tennessee's forests are being altered at an increasing rate due to the societal and environmental changes occurring in and around them. Tennessee is not the only southern state whose forest is being affected. In 2003 the Southern Forest Resource Assessment (SFRA) was published and it examined a wide range of forest sustainability issues including urbanization, timber harvesting, chip mills, forest pest, and climatic change. Extensive findings regarding the forest resource conditions in Tennessee can be found throughout the SFRA. The Tennessee Forestry Commission has been directed by the Tennessee General Assembly, through House Joint Resolution 189 (HJR 189) to evaluate the SFRA relative to forest resource issues in Tennessee.

The following report contains information from the SFRA that relates to Tennessee, a summary of public participation, and the findings and recommendations of the Tennessee Forestry Commission. The Forestry Commission has divided their report into the following five themes found within the SFRA: urbanization and the wildland-urban interface, forest fragmentation, forest health, timber resources, and water quality.

In order for the Forestry Commission to adhere to the directions outline in HJR 189, the Commission hosted public meetings in Jackson, Nashville, Knoxville, and Chattanooga during the month of October 2003. At the meetings the public provided input verbally or through written comment. In addition to the public meetings, the public was able to comment via mail, email or fax until November 3, 2003.

## Public Hearing Locations



# Recommendations from the Tennessee Forestry Commission

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## **Urbanization & the Wildland-Urban Interface:**

1. It is recommended the division redirect personnel to work in the interface area.
2. It is recommended the division develop an internal plan that directs its foresters to become a viable part of the community planning process.
3. It is recommended the division develop and provide educational materials and programs appropriate for interface residents.
4. It is recommended priority be given to the budget improvement request submitted by the Forestry Commission for fiscal years 2004 and 2005, which includes funding for aerial fire suppression contracts in the amount of \$100,000.
5. It is recommended the division utilize the Tennessee Fire Service and Codes Enforcement Academy as their training center for wildland and wildland-urban interface fire fighter training programs.
6. It is recommended priority be given to the Forestry Commission's 2004 and 2005 budget improvement request to replace the division's communication system at an approximate cost of \$6,000,000.
7. It is recommended the Division of Forestry work towards converting at least 50 percent of their pumpers to a Type VI unit when replacing existing equipment.

## **Forest Fragmentation**

1. It is recommended the division increase the number of education opportunities for existing and new forest landowners in timber management, wildlife habitat improvements, and alternative uses of their forests.
2. It is recommended the division continue their role in the Forest Legacy Program.

### **Forest Health**

1. It is recommended priority be given to the Forestry Commission's budget improvement request for fiscal years 2004 and 2005, which included provisions for recurring dedicated funds of \$250,000 to slow the spread of the gypsy moth.
2. It is recommended the Division of Forestry and the University of Tennessee Department of Forestry, Wildlife and Fisheries continue to assist landowners in maintaining healthy and productive forests through improved markets for small diameter timber, education of landowners on the importance of thinning and early detection of forest pest problems.
3. It is recommended that until effective control methods are developed, the division increase efforts for the preparation to restore hemlock habitat where hemlocks are a major component.
4. It is recommended the division continue to monitor new pests and diseases, such as sudden oak death and emerald ash borer, and advise the legislature on appropriations needed to fund necessary actions to lessen the adverse economic and resource impacts.

### **Timber Resources**

1. It is recommended the Division of Forestry and the University of Tennessee Department of Forestry, Wildlife, and Fisheries collaborate and research methods to improve Tennessee hardwood forest management and provide Tennesseans with the best hardwood seedlings available.
2. It is recommended the Tennessee Forestry Commission and the Division of Forestry encourage the University of Tennessee Forest Products Center to research and develop new value-added products that utilize all grades of hardwoods.
3. It is recommended the Forestry Commission, along with the Division of Forestry, establish a working group to evaluate the benefits of and/or feasibility of forester certification, licensing and/or a registration program.
4. It is recommended at this time no action take place to address the issue of increasing pine plantations in Tennessee.

## **Water Quality**

1. It is recommended the division seek federal or state funding for two additional full time positions for water quality foresters to increase the state's ability to assist with implementation of forestry BMPs.
2. It is recommended the Department of Agriculture seek an amendment to the Tennessee Code Annotated to include authorization for employees to go upon any land for the purpose of investigating forestry BMP implementation and water quality complaints.
3. It is recommended division foresters work closely with municipal planning departments to promote the use of trees as a vegetative solution to reduce peak flooding and control stormwater runoff.
4. It is recommended the division cooperate with Tennessee Forestry Association in developing a procedure to inform wood buyers/receivers about the delivery of wood from a logger/operator who is not properly implementing forestry BMPs.
5. It is recommended the division continue to evaluate the proper use of forestry BMPs by setting specific performance goals and reporting implementation survey findings on a three-year basis.

**Wildland-urban interface:**

The geographical area where two diverse systems – forest and urban – meet and interact, giving rise to conflicts concerning management of natural resources.

A Forester's Handbook for the Wildland-urban interface

# Urbanization & the Wildland-Urban Interface

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*“Among forces of change, urbanization will have the most direct, intermediate and permanent effects on the extent, condition, and health of forests (Summary, 92).”*

The South faces the possibility of losing over 12 million forest acres to urbanization by 2020 according to the SFRA (Summary, 11). More people have the desire to own and live on forested rural land. They have the aspiration to watch their investment grow, they wish to farm, they enjoy the natural resources of the state, and/or they would like to have an estate to pass along. (SFRA, 234) This desire to live in more rural landscapes is resulting in more urbanization due to rural owners wanting the same type and level of services (i.e. medical, schools, shopping, fire protection, police protection, etc.) that urban dwellers enjoy. Future southern foresters will need to be competent in assessing and prescribing management practices appropriate for the diversity of forest resource values (SFRA, 233).

Tennessee has the sixteenth largest population in the United States and experienced a 16.7 percent increase in population from 1990 to 2000 (ranked fourteenth) according to the U.S. Census Bureau. Also, Tennessee is home to 9 of the nation's top 250 fastest growing counties: (U.S. Census Bureau, created 2001)

Rank	County Name	Percent Change 1990 to 2000
61	Williamson	56.3
73	Rutherford	53.5
158	Sevier	39.4
175	Meigs	38.0
189	Tipton	36.5
213	Cumberland	34.7
222	Jefferson	34.2
224	Montgomery	34.1
239	Hickman	33.1

Data source: U.S. Census Bureau (2001)

It is forecasted that urbanization in the South will continue at a rate of 1.1 million acres per year until 2020 (Summary, 11). In Tennessee major effects from urbanization are predicted to be in central Tennessee, especially around Nashville and the area surrounding Knoxville (Summary, 11 & 28). Included with the effects from urbanization is the risk that Tennessee faces, of losing major structures and life from wildland fires due to urbanization in localized areas, such as what occurred in California.

House Joint Resolution 189:

The most significant factor influencing forest sustainability in Tennessee is the loss of forest land to urbanization, notably in Central Tennessee.

**Summary of Public Participation:**

The public is overwhelmingly concerned about the impacts of urbanization on Tennessee's forest resources. Over 55 percent of the public comments on urbanization were related to development and urban sprawl.

*"Though we presently do not contend with the degree of urban sprawl that many of the surrounding counties do, its presence is upon us and we are very concerned with the health and well-being of our forestlands, our wildlife and our waters"* McNairy County Forestry Landowner Association

*"Chattanooga is currently marketing as the "Boulder, CO of the east." Our forest's biodiversity is mandatory for this attempt to attract those looking for a higher quality of life and bringing high paying jobs with them."* Environmental City Task Force

*"The fact of Urban Development will not go away. As the population of Tennessee grows, so will the concerns of the forest increase. The Assessment can be a good tool to follow when trying to keep what forested land we have from being wasted or attacked by insects or by fire."* Scott Guffey

**The Forestry Commission Finds:**

- There will be a significant loss of hardwood timberland to urbanization.
- Urbanization will occur in Tennessee, especially around the state's major metropolitan areas of Nashville, Knoxville, Memphis, Chattanooga, and the Tri-Cities.
- Urbanization brings new management and economic challenges to the forestry community.
- Foresters working in the wildland-urban interface need additional training to address the unique forest resource issues, diverse organizations, governments and citizens that reside there.
- Foresters need to take a more active role in local planning processes within their community.
- Residents of the wildland-urban interface require educational materials that address their needs.

- Urbanization alters the strategies and techniques that are effective in forest protection services.

### **The Forestry Commission Recommendations:**

1. *The wildland-urban interface requires better-trained and highly skilled foresters to be able to work with both rural and urban forest management issues. Currently, the division has 33 forester positions that provide technical assistance in forest resource management; two of which work in the urban environment. In order to meet the growing need for technical forestry expertise **it is recommended the division redirect personnel to work in the interface area.***

The Division of Forestry is faced with an increasing and changing demand for technical assistance through its professional forester workforce. The number of landowners is increasing and parcel size is decreasing. In many cases the type of assistance needed is shifting to non-monetary values, small tract applications, and urban forest management. Much of this change is occurring as a result of urbanization and the increasing relocation of residences into rural areas.

The division should redirect personnel and develop interface forester positions that will be responsible for delivery of agency programs and services to the general public, property owners, and regional, county and local governments. Interface foresters should provide specialized technical assistance for small tract applications, forest health, land use planning, and urbanization issues on a regional basis.

2. *Effective management of urban and community forest requires cooperation among forest resource managers, citizens and local government officials, primarily planning and zoning departments. **It is recommended the division develop an internal plan that directs its foresters to become a viable part of the community planning process.***

Foresters can assist planning departments understand the importance of maintaining tree canopy cover in their cities and the benefits trees provide. The division's foresters need to assist communities in the development of tree ordinances in order to provide continued use of silvicultural practices in close proximity to communities and to allow the community to maintain tree canopy cover during the development process. In addition, foresters may provide information about urban forests and how trees can serve as a vegetative solution to environmental problems, such as air quality and stormwater runoff.



3. *The residents of the wildland-urban interface are requesting educational materials designed to address their unique needs. **It is recommended the division develop and provide educational materials and programs appropriate for interface residents.***

Residents of the wildland-urban interface require educational information relating to their land and forest resources. Examples of useful educational material for interface residents might include landscaping in natural areas, management of small wooded lots, and measures to protect homes from forest fire.

4. *As urbanization of forested lands continues, the threat to homes, businesses and communities from fire grows and values threatened increase significantly. It is critical that the Division of Forestry implement the latest strategies and technologies for fighting wildland fires in the wildland-urban interface. **It is recommended priority be given to the budget improvement request submitted by the Forestry Commission for fiscal years 2004 and 2005, which includes funding for aerial fire suppression contracts in the amount of \$100,000.***

When the Division of Forestry is in need of aerial fire suppression assistance it relies on the USDA Forest Service, the Tennessee Army National Guard and members of the Southeast Interstate Forest Fire Protection Compact (11-4-501 TCA).

Aerial suppression assistance requests through partnering organizations are filled based on priority. A high priority situation where one or more dwellings are threatened may be filled in minutes. A low priority of controlling a remote wildfire may require a day or more to fill. Response time for aerial resources through the Forest Service, Tennessee Army National Guard and the Compact is estimated to be one to two days. At times, the division has needed aerial support quickly and was unable to acquire it until the next day.

The Forestry Commission believes the division needs their own dedicated contract with companies that provide aerial fire suppression services. These contracts need to be in place every fire season to ensure that Tennessee's fire managers have priority access to air tankers and helicopters to assist them in protecting Tennessee's forest resources from fire.

5. *The wildland-urban interface requires better-trained, better-equipped, and better-organized fire and volunteer fire departments and personnel. **It is recommended the division utilize the Tennessee Fire Service and Codes Enforcement Academy as a training center for wildland and wildland-urban interface fire fighter training programs.***

The division receives federal grants that are used for training volunteer fire department personnel in wildland fire suppression. Annually, the division trains 1,500 volunteer fire fighters. Efforts should continue to increase the level of wildland forest fire training and the utilization of Tennessee's Fire Service and Codes Enforcement Academy.

6. *Fighting forest fires is a dangerous job especially when equipment is unreliable and old. The Governor's proposed budget for fiscal year 2005 addresses the Division of Forestry's bulldozer equipment needs, which the Forestry Commission fully supports; however, the division's communication system needs to be replaced as well. **It is recommended priority be given to the Forestry Commission's 2004 and 2005 budget improvement request to replace the division's communication system at an approximate cost of \$6,000,000.***

The division needs to replace over 560 handheld fireline radios and other obsolete components of their \$6 million radio network because their technology is no longer supported by vendors and replacement parts are not available. It is crucial that all fire fighters have the capability to communicate with each other and with the fireline command center. To update the division's radio system, new programmable portable radios are needed and additional 13 microwave towers/antennae to ensure contiguous radio coverage for all fire fighters throughout the state.

7. *Along with adapting new strategies and techniques to fight fires in the wildland-urban interface, the division needs proper equipment. **It is recommended the Division of Forestry work towards converting at least 50 percent of their pumpers to Type VI units when replacing existing equipment.***

A Type VI unit consists of a 1-ton rated pickup truck equipped with a 200 to 300 gallon wildfire pumper, hose and related equipment. This equipment is an integral part of fighting fires in the wildland-urban interface. When it is time for the division to have vehicles replaced, the Commission recommends that they be replaced with 1-ton rated pickup trucks in order for the division to safely carry higher volumes of water to the fireline. It is further recommended that slip-on pumper units with a wildfire pumper, hose and other fire related equipment (estimated cost \$15,000) be installed.

# Forest Fragmentation

*“Private timberlands in the South are held in more than 4.9 million tracts. The number of private ownerships is increasing, and tract sizes are decreasing.” (SFRA, 225)*

According to the SFRA, approximately 89 percent of the timberlands in the south are privately owned (SFRA, 233). Two thirds of all private timberland tracts were less than 10 acres in 1994 (SFRA, 225). The process of increasing numbers of landowners and decreasing acreage can be defined as forest fragmentation. Forest fragmentation is a combination of land use changes accelerated by change in ownership, which may result in a reduction in the amount of interior forest and may increase the amount of edge forest. For the most part, the impact forest fragmentation has on Tennessee’s forest resource is negative.

## Negative Impacts

- The amount of forest industry landholdings is decreasing. (Tennessee Forest Industry Land Report, 2001 updated 2004)
- Smaller tracts of private land are less likely to yield timber for commercial use. (SFRA, 336)
- The fragmenting of forest lands means a decrease in intact or interior forest that is essential for the survival of several wildlife species including some migratory neotropical birds.

*The Ridge and Valley and the Interior Low Plateau of Tennessee are areas where forest fragmentation and negative edge effects are most widespread. (Summary, 71)*

- Forest fragmentation is partly responsible for the decreased percentage of private landowners allowing public access to their land.

## Positive Impacts

- Wildlife species that require forest edge effect to survive will have an increased acreage in habitat.
- More people can have an opportunity to own and manage forest land.

House Joint Resolution 189:

Demand will increase for a broad range of multiple resource benefits as access to private forest land decreases.

Loss and fragmentation of forest land will impact certain wildlife, particularly Neotropical migrant bird species.

**Summary of Public Participation:**

The public is concerned about the fragmentation of Tennessee's forests. The four major areas of concern for the public are: incentives for landowners that include tax incentives, parcelization and development of forest lands, the need for more professional government foresters, and wildlife.

Thirty percent of the people that addressed forest fragmentation in the public hearings were concerned about incentives for landowners. This is an important concern of the public that needs addressing by the Forestry Commission at a future point in time.

*"TFA (Tennessee Forestry Association) strongly believes educational support and incentives are needed to provide the 470,000 private landowners in Tennessee alternatives to the sale of forest land for development and other land use conversions."*

*"...Monetary incentives are a fair return to non-industrial private landowners who provide services for the rest of the State." Cumberland County Chapter of Save Our Cumberland Mountains*

*"...Changes in the Tennessee tax structure that would provide incentives for landowners to perpetuate and/or initiate the growing of trees using sound forest management planning and practices." Forest Resource Association*

**The Forestry Commission Finds:**

- New forest landowners need education/information on forest management options and the timber and nontimber resources their properties possess.
- Tennessee's wildlife populations are impacted by forest fragmentation and the loss of interior forest habitat. The fragmentation of forest land results in poor habitat conditions for certain wildlife species but adds beneficial habitat for other wildlife species.
- Forest industry is selling off large portions of their lands in Tennessee. In the past five years forest industry has sold off more than 617,000 acres. Most of the land is being sold to timber investment management organizations (TIMOs), banks and then to individual private landowners. (Tennessee Forest Industry Land Report, 2001 updated 2004)
- Forest fragmentation will continue to increase on private lands through the recurring sales of land and the potential for development.

- Owners of smaller tracts of forest land most likely do not have forest management plans or skills to manage their land properly.
- Private landowners of small tracts of forest land are less likely to use their property to yield timber for commercial use.

### **The Forestry Commission Recommendations:**

1. *New forest landowners in Tennessee need to be properly educated about managing their forests. **It is recommended the division increase the number of education opportunities for existing and new forest landowners in timber management, wildlife habitat improvements, and alternative uses of their forests.***

Throughout the public hearing, the Commission heard that the Division needed to take the lead role in educating landowners about how to manage their property not only for timber or wildlife but also for alternative uses. Through increasing involvement with County Forestry Associations, the division can educate landowners about the opportunities they have to utilize their forestlands.

2. From a fragmentation standpoint, Tennesseans benefit from large tracts of forest land. **It is recommended the division continue their role in the Forest Legacy Program.**

The division should continue to assist state agencies in acquiring Legacy tracts. The Forest Legacy Program is a federal program that focuses on conservation by purchasing environmentally sensitive land or easements on tracts threatened by development or urbanization.

# Forest Health

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*“A healthy forest has the capacity to vigorously renew itself and to recover from a wide range of disturbances, while meeting current and future human needs for desired levels of values, uses, products, and services (SFRA, 404).”*

With a global economy and free trade come consequences that affect the health and well-being of our nation’s forests. The SFRA states, “Introduced insect and disease pests have the potential to permanently alter ecosystems in the south (SFRA, 403).” The US forests continue to be altered by harmful pests and diseases.

The American chestnut is no longer a component of the eastern forest and is no longer a source of food for wildlife; it has been lost due to an introduced fungus from Asia (SFRA, 418). The American elm will no longer line our city streets with its majestically beautiful arching branches because of Dutch elm disease. The oak trees that dominate the forests of Tennessee are or will be threatened by the gypsy moth and sudden oak death. Dogwoods are no longer present in some of the upper elevations of the Appalachian Mountains due to anthracnose (SFRA, 416). The hemlock trees that are found over the eastern part of Tennessee are now in danger because of an adelgid (SFRA, 418).

Currently, the leading causes of risk in southern forest are the gypsy moth and the southern pine beetle (SFRA, 422). As the United States continues to trade within its own borders and with other countries, more threats are being introduced into our forest ecosystem with a greater chance of Tennessee’s forests being impacted. (More detailed information about these insects and disease can be found in the appendix.)

## House Joint Resolution 189:

Insect and disease infestations will be recurring problems in the absence of adequate management activities in pine stands sustained and efforts to monitor and control gypsy moth and oak decline in hardwood forests.

## Summary of Public Participation:

Sixty-six percent of the public’s concern with forest health related to the topics of southern pine beetles, increase in professional public foresters, and research.

*“The appropriate role for public policy in Tennessee to help provide a sustainable forest should include providing research to develop and implement programs to reduce threats to Tennessee’s forests from disease, pests, and wildfires.” Dwayne Wilson*

*“More research should be committed for increased research and control efforts as well as educational programs for landowners to improve forest health through active forest management.” Agricultural Extension Service, The University of Tennessee Institute of Agriculture*

*“Landowner education into how to best manage their forest stands to prevent infestations and wildfire should be emphasized. Money and manpower for research and prevention should be a priority.” Preston Padgett*

### **The Forestry Commission Finds:**

- The public is concerned about the health of Tennessee’s forest and the state’s ability to manage insect and disease problems.
- At the current rate of man-caused spread, the gypsy moth front is projected to arrive in Tennessee in 2009 and isolated outbreaks of gypsy moth populations are expected before then.
- The southern pine beetle will be a recurring problem in Tennessee in over-mature and overcrowded pine stands.
- A great deal of concern exists over the loss of hemlock trees from the hemlock woolly adelgid and the impact the loss will have on the ecosystem, particularly riparian corridors and wildlife habitats.
- There will always be insects and diseases threatening Tennessee’s forest. Consequently there is a need to manage these forests to maintain health and vigor.
  - Since the SFRA was written, two other pest and disease concerns have emerged, the emerald ash borer and sudden oak death. A survey will be conducted in the near future to determine if this borer is in Tennessee, especially the central part of the state where ash is a more common species of the forest. A second survey of sudden oak death will be conducted in 2004 to see if the disease has entered Tennessee and endangered Tennessee’s vast oak resources.

### **The Forestry Commissions Recommendations:**

1. *Protecting the forest resources in Tennessee from the gypsy moth is an important responsibility of the Division of Forestry. The division needs to continue taking a proactive approach in combating the gypsy moth in Tennessee. **It is recommended priority be given to the Forestry Commission’s budget improvement request for fiscal years 2004 and 2005, which included provisions for recurring dedicated funds of \$250,000 to slow the spread of the gypsy moth.***

When the gypsy moth establishes itself in most of Tennessee, the health of Tennessee’s hardwood forest resources will be severely impacted, as well as the forest industry that utilizes hardwoods. The forest industry contributes \$18.2 billion dollars to the Tennessee economy and in 2001 Tennessee manufactured 887.5 million board feet of hardwood products and 184.7 million board feet of softwood products (University of Tennessee,

Institute of Agriculture). By evaluating the impact of the gypsy moth in other states it is estimated that when Tennessee becomes fully infested, the gypsy moth will impact Tennessee's economy by \$200 million annually. The forest industry will suffer the second largest impact of approximately \$60 million annually, but it is Tennessee's tourism that will suffer the greatest economic impact of approximately \$115 million annually. (The Gypsy Moth in Tennessee, 1996)

Currently, the Division of Forestry is working with the federal government to monitor the status of the gypsy moth and to control or eradicate isolated outbreaks. The division has developed a draft of an aggressive strategic plan, which lays the foundation for managing the gypsy moth. In order to have an effective gypsy moth program the division needs legislative support for recurring dedicated funding of \$250,000 to monitor and eradicate the gypsy moth.

(A copy of the strategic plan can be requested through the Division of Forestry.)

2. *The pine forests and plantations of Tennessee are always subject to attack from natural pests, such as southern pine beetle. Maintaining health and vigor reduces the probability of attack. It is recommended the Division of Forestry and the University of Tennessee Department of Forestry, Wildlife and Fisheries continue to assist landowners in maintaining healthy and productive forests through improved markets for small diameter timber, education of landowners on the importance of thinning and early detection of forest pest problems.*

The southern states are experiencing a significant reduction in pine plantation thinning due to limited markets for small diameter products and a high number of pine plantations requiring a first thinning. Many landowners are opting not to thin their pine because there is no market for the timber. This landowner decision will decrease the health of pines and make them more susceptible to southern pine beetle attack. The Forestry Commission encourages the University of Tennessee Department of Forestry, Wildlife and Fisheries to collaborate with other southern state universities and the USDA Forest Service in developing markets for small diameter pine products. Also, the Commission recommends the Division of Forestry increase landowner education programs on the importance of thinning young crowded stands to maintain health and vigor.

3. *Hemlock trees in Tennessee are being threatened by the hemlock woolly adelgid. There is great concern over potential loss of both the Carolina hemlock and the eastern hemlock in our forest ecosystem. It is recommended that until effective control methods are developed, the division increase efforts for the preparation to restore hemlock where hemlocks are a major component.*

The hemlock woolly adelgid has been found in Blount, Cocke and Sevier Counties, mainly in the Great Smoky Mountains National Park, as well as Carter and Johnson Counties in northeastern Tennessee. Without more intensive management and survey work, hemlocks could be eliminated from Tennessee's forest. The economic impact of the hemlock loss is currently unknown. Many predict there will be a significant monetary impact to the fly-



fishing, recreation, tourism and nursery industries. Tennessee will also lose aesthetic value and crucial wildlife habitat for neotropical migrant birds, salamanders, and native trout. The division needs dedicated funds to carry out hemlock habitat restoration efforts; the financial needs listed in the division's draft strategic plan are only an estimate and are likely less than needed. The current strategic plan calls for the accelerated implementation of control tactics, surveying and monitoring, the establishment of a hemlock seed orchard and the restoration of hemlocks in areas killed by the adelgid. As the division increases work in hemlock habitat restoration, the division will communicate with the legislature on the appropriation needs for hemlock habitat restoration. (Rhea, 1994)

(A copy of the strategic plan can be requested through the Division of Forestry.)

4. *Several new and emerging insects and diseases are currently affecting Tennessee's forests. It is recommended the division continue to monitor new pests and diseases, such as sudden oak death and emerald ash borer, and advise the legislature on appropriations needed to fund necessary actions to lessen the adverse economic and resource impacts.*

# Timber Resources

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*“The South produces approximately 60 percent of the Nation’s timber products, almost all of it from private forests; the South produces more timber than any other single country in the World, and it is projected to remain the dominant producing region for many decades to come.” (SFRA, 299)*

According to the SFRA projections, the demand for timber in the South will increase in the upcoming years. Tennessee along with Alabama, Arkansas, Kentucky and Virginia will see the largest increase in production for both hardwood and softwood. (SFRA, 299) In Tennessee, softwood growth and removal rates are projected to increase through 2040 with growth always being greater than removals. The hardwood removal rates for Tennessee are predicted to increase while growth will slightly decrease with removal equal to growth in 2035. (SFRA, 321)

## House Joint Resolution 189:

Chip mill technology does not threaten future timber supplies or forest health but may cause local structural change to forests and influence local economies.

Tennessee will experience large percentage increase in timber production with hardwood growth and removal projected to be equal by 2035.

Total pine (natural, mixed, and planted) acreage in 1999 (1.5 million acres) is less than total pine acreage in 1952 (1.8 million acres).

Planted pine amounts to only 3 percent of the total timberland in Tennessee, but the area of pine plantations is expected to increase from 458,000 acres in 1999 to approximately 1 million acres by 2040.

Hardwood and natural mixed hardwood forests comprise 90 percent of the forests in Tennessee (12.4 million acres) and are expected to decline to about 10 million acres by 2040.

## Summary of Public Participation:

The comments from the public on the theme of timber resources were significant in numbers and topics. The top five topics discussed by the public were in regards to silvicultural practices—including clearcutting, the conversion of land to pine plantations, an increase in government regulation, economic conditions, and private property rights.

*“Expansion of monoculture plantations has many serious shortcomings—for hunters and the recreation- and tourism-minded public, for water quality and, thus, for public health, for successful control of blights and pests such as bark-beetle outbreaks and, especially, for wildlife.”* *League of Women Voters in Tennessee*

*“We anticipate that the vast acreages of existing pine plantations will be harvested and allowed to naturally regenerate to hardwoods or mixed stands. Private investments in pine plantations will be a function of each landowner’s tolerance to risks, investment capital, and market conditions... We do not see pine plantation acreages more than doubling in less than 40 years in Tennessee as projected, and very much doubt that there will be any increase at all.”* *Tennessee Timber Consultants*

*“We are not large timber producers, but we feel the effects of timber legislation much the same. Laws that regulate private forestry often create a burden to the small timber grower with limited resources.”* *McNairy County Forest Landowners Association*

*“...clear-cut may be the right method for regeneration of a oak-hickory or oak-pine stand. But this tool will be lost if there is no regulation of the giant clear cuts and pine conversions that are now occurring and which SFRA projects will increase.”* *Brian Paddock*

### **The Forestry Commission Finds:**

- The Division of Forestry should serve as a leader to increase focus on managing Tennessee’s hardwood resources, which comprise nearly 90 percent of all forested acres.
- Additional research, equal to the magnitude of the hardwood resource, is needed to better understand the management and regeneration of Tennessee’s hardwood resources.
- Tennessee’s natural resource professionals should be provided with more training opportunities in silviculture and nontimber values of hardwood forests.
- Additional markets are needed to utilize low-grade hardwoods and provide landowners an opportunity to improve stand quality.
- Some constituents have a great concern over the projected acreage increases of pine plantations in Tennessee over the next 36 years.
- The South’s timber resources will continue to have a significant role in the global economy.
- The public has negatively commented on the distribution of timberland by stand size class and stand origin. Apparently, the concern is about the loss of sawtimber acreage supposedly due to over cutting of the poletimber size class.
  - After careful review of the 1989 and 1999 forest statistics data for TN, the concern the public has is unfounded. It was determined that 83 percent of the acres in the poletimber size class from the 1989 data stayed in the poletimber class or moved into the sawtimber class in the 1999 analysis. (Schweitzer, 2000)

## The Forestry Commissions Recommendations:

1. *Tennessee forest managers need access to the best information available to grow high quality hardwood forests. Management needs include technology to grow genetically superior seedlings, effective survival of artificial regeneration in open land and cutover forest stands, applicable natural reforestation techniques, and advanced technology for hardwood management. **It is recommended the Division of Forestry and the University of Tennessee Department of Forestry, Wildlife, and Fisheries collaborate and research methods to improve Tennessee hardwood forest management and provide Tennesseans with the best hardwood seedlings available.***

Ninety percent of Tennessee's forest resource is composed of hardwood forest types. Much of this resource has been high-graded for decades. Researching and developing effective artificial hardwood regeneration techniques can provide a tremendous tool that results in better control of species composition and timber quality of regenerated stands. The Division of Forestry and the University of Tennessee Department of Forestry, Wildlife and Fisheries should aggressively increase their involvement in all aspects of a strong hardwood seedling program, effective means of competition control in cutover and open lands, and developing acceptance of artificial hardwood regeneration within the forestry community. The goal of such research should be development of operationally efficient regeneration techniques that provide more control over stand species composition and quality, resulting in accelerated improvement of Tennessee's hardwood resource.

2. *Domestic markets utilizing both low- and high-grade hardwoods will provide more opportunities for landowners to actively manage their forest lands. **It is recommended the Tennessee Forestry Commission and the Division of Forestry encourage the University of Tennessee Forest Products Center to research and develop new value-added products that utilize all grades of hardwood.***

Past high-grading on good hardwood sites combined with inherent low productivity of other sites has left many forested acres in Tennessee stocked with tremendous amounts of low-grade hardwoods. In many situations removal of low-grade hardwoods is the greatest challenge forest landowners face to implementing better forest management. Diversified, sustainable markets for low-grade hardwoods will provide market incentives for forest landowners to correct decades of high-grading on high quality sites. The 1996 Governor's Conference on Agriculture and Forestry stated, "The Tennessee Forest Products Center will enhance value-added manufacturing and processing opportunities for Tennessee's forest products producers". The Tennessee Forestry Commission and the Division of Forestry should collaborate with the Tennessee Forest Product Center to intensify research on creating new value-added forest products from low-grade hardwoods. The ultimate goal of such research should be the development of operationally efficient manufacturing processes utilizing low grade hardwoods that encourages existing industry to diversify their operations and to encourage value-added forest industry to locate in Tennessee.

3. *Other states have certified, licensed, and registered foresters to ensure the quality of services rendered. The issue of forestry professional's credentials has been debated in Tennessee for several decades. **It is recommended the Forestry Commission, along with the Division of Forestry, establish a working group to evaluate the benefits and/or feasibility of forester certification, licensing and/or a registration program.***

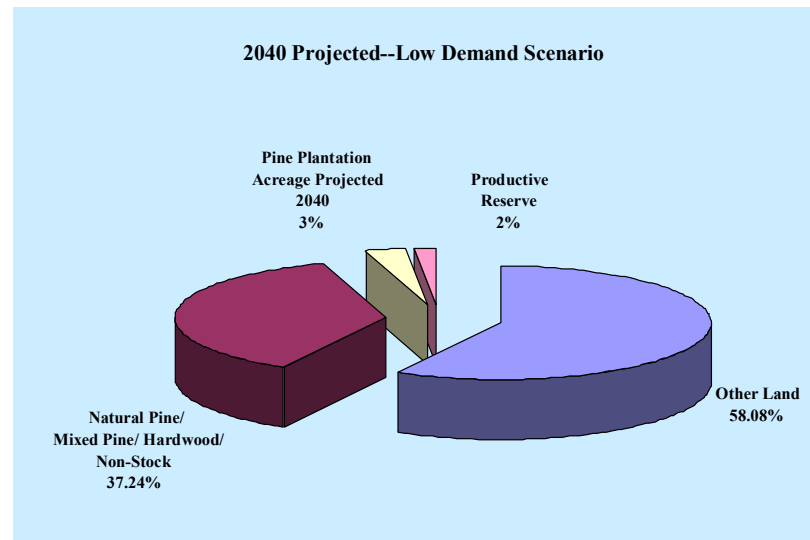
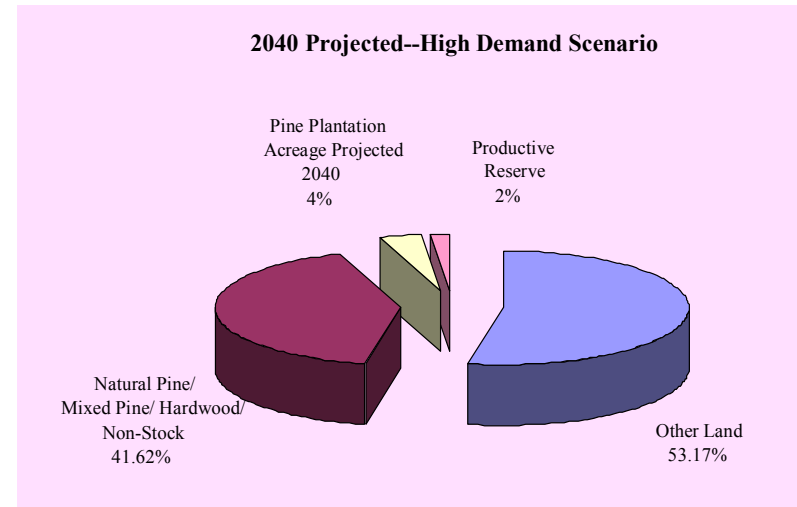
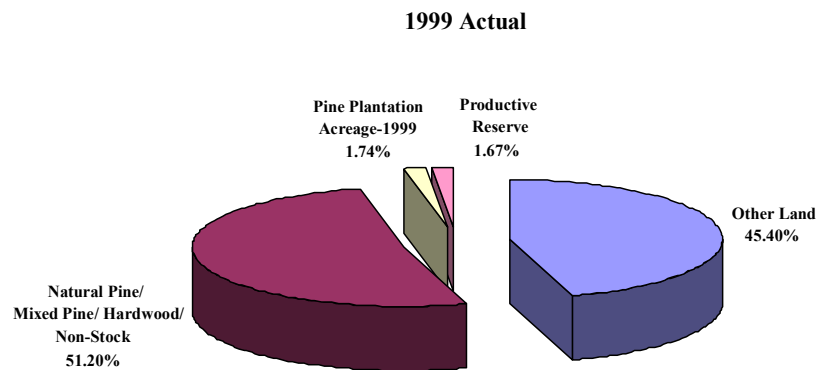
There has been support for the Forestry Commission to investigate forester certification, licensing or registration programs for Tennessee. In 1998, the Forest Management Advisory Panel stated: "As society expects better and more sustainable forest management, it becomes increasingly more important to ensure that professional foresters are adequately trained and registered." With this in mind, the Forestry Commission recommends the formation of a working group to investigate the issue of certification and if beneficial, develop the framework for a program in Tennessee. The working group should be comprised of representatives from all sectors of forestry.

4. *Recently, there has been an increased concern over pine plantations in Tennessee and the number of acres in planted pine. The SFRA projects 550,080 additional acres of pine plantations over the next 36 years. This increase would represent about four percent of the forested acres in Tennessee. Given the current low rate of new pine plantation establishment, **it is recommended at this time no action take place to address the issue of increasing pine plantations in Tennessee.***

The Forestry Commission does not believe the increase in pine plantations will be as high as predicted in the SFRA. The models developed for the SFRA were designed to determine whether or not the south could sustainably produce forest benefits in a high demand economy throughout the projection period. Under these conditions, the SFRA model predicted pine plantations in Tennessee will more than double. The likelihood of high demand economy over the next 40 years is unknown. However, the loss of hardwood acreage to urban development has a greater probability and impact than any increase in pine plantation acreage. (See chart on page 21)

Also, the SFRA model utilized past trends, which may not continue into the future and there are no mechanisms within the model to consider the loss of pine plantations from southern pine beetle and other forest health issues. The model does not account for the current trend of forest industry divesting itself of landholdings and the forest industry using new fiber recycling techniques. The Commission strongly believes that the increase in pine plantation acreage will not be as significant as projected in the SFRA. A further discussion on pine plantations and the Commission's conclusion can be found in appendix . (Abt, 2003)

# A Representation of Tennessee's Land Acreage



# Water Quality

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*“Significant water-quality impairment, forest loss, and wetland loss have occurred in the South since the time of European settlement; however, water quality has generally improved since the passage of the Clean Water Act in 1972” (SFRA, 455)*

The forests of Tennessee have an important function in improving and maintaining the water quality of its rivers and streams. Water flowing through forested areas has shown lower sediment and nutrient yields creating conditions more suitable for aquatic life than areas void of forests (Summary, 80). From 1988-1998, siltation, sedimentation, bacteria and other pathogens, and nitrogen, phosphorous and other nutrients were the leading causes of water quality degradation. During the same timeframe, agriculture and urbanization were the leading sources of water quality degradation. (Summary 79-80)

The SFRA lists the ten sources of point and nonpoint source impairments to water quality as municipal, storm sewer/runoff, industrial, land disposal, agricultural, hydrological/habitat modification, resource extraction, construction, silviculture and natural. Of these ten sources, silviculture is ranked tenth (last) as a contributor to water pollution in Tennessee. (SFRA, Table 19.4)

On harvested sites, there is generally a high rate of forestry best management practice (BMP) implementation among the southern states and public and industrial private lands tend to have the highest forestry BMP implementation rate. Voluntary forestry BMPs have been adopted by all thirteen southern states to protect the quality of water during harvesting operations. (Summary, 80)

House Joint Resolution 189:

Silviculture ranks last among twelve sources of impairment to rivers and streams.

(Tennessee Department of Environment & Conservation's  
2000 305b Report-The Status to Water Quality in Tennessee)

## **Summary of Public Participation:**

Public comments related to water quality were from a wide array of perspectives. Thirty-seven percent of the participants that discussed water quality mentioned forestry BMPs. The second most discussed topic was mandatory BMPs.

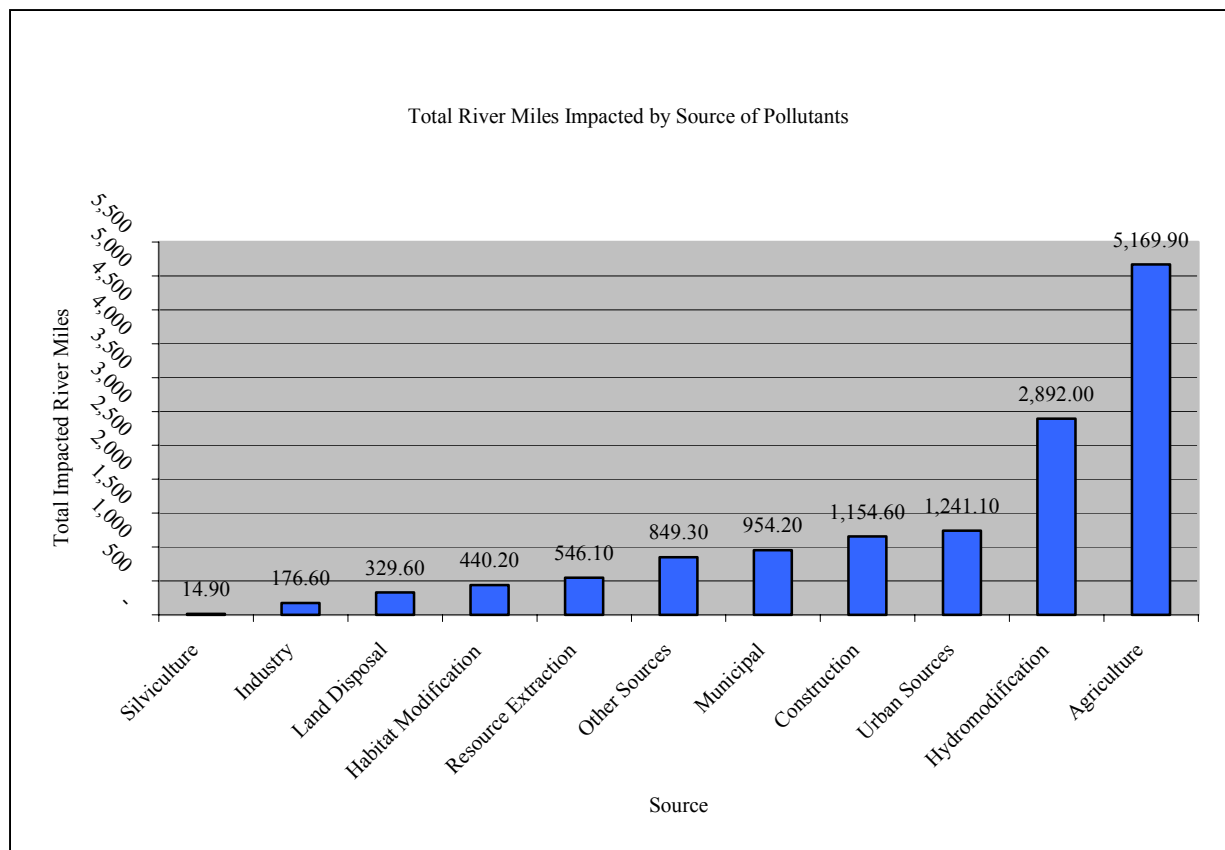
*“(The Master Logger Program is a) pro-active educational program that is having positive impacts and is protecting water quality through a non-regulatory program. Best*

*management practices are working without the burden of regulations! This is an excellent example of how educational programs can benefit landowners and the forest resources.” Kentucky-Tennessee Society of American Foresters*

*“Negative impacts on water can be reduced by controlling harvesting amounts and methods by: licensing of master loggers, requiring a review and approval of pre-harvest plans, or making BMP’s mandatory.” John C. Wund*

### The Forestry Commission Finds:

- Silvicultural practices are not a major contributor to nonpoint source pollution to Tennessee’s rivers and streams.
- There is significant public concern about the impacts forest harvesting operations have on water quality.
- Some of the public’s concern over water quality and the impact from silviculture practices is not supported in the results of TDEC’s water quality analyses and the SFRA.

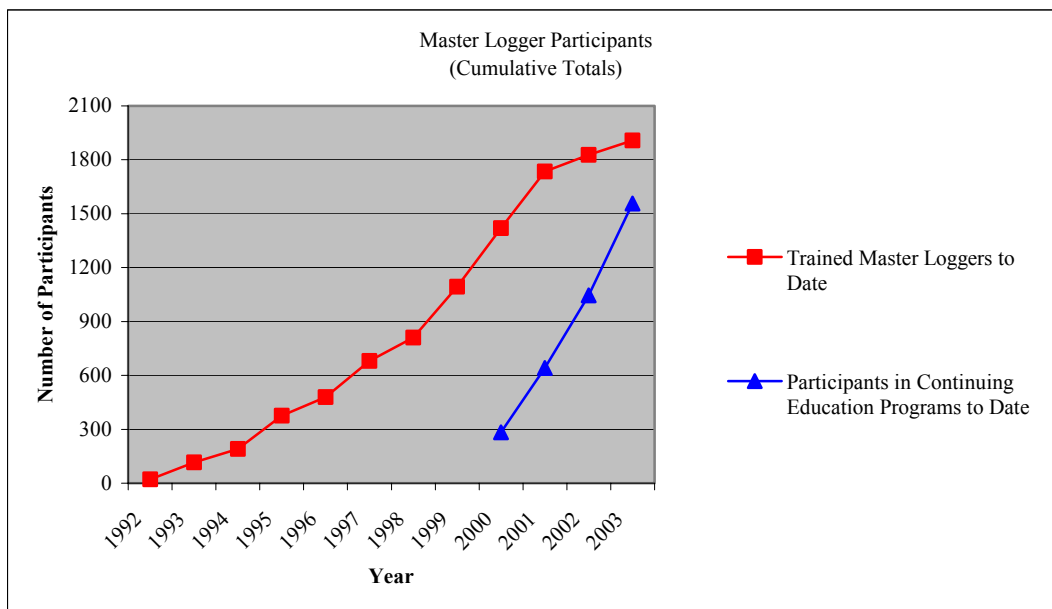


(Tennessee Department of Environment & Conservation's 2002 305(b) Report-The Status of Water Quality in Tennessee)

- Through the Master Logger Program, third party certification, and government funded programs, the forestry community has been very proactive in encouraging forestry BMP implementation.



- A revised edition of the Tennessee's *Guide to Forestry Best Management Practices* was published in 2003 and serves to educate forestry professionals, forest industry and landowners about protecting Tennessee's water quality during harvesting operations.
- A rule for Silvicultural Activity Stop Work Orders (2001) is a significant component in ensuring Tennessee's water quality.
- Tennessee's Forest Land Enhancement Program (FLEP) has a water quality and watershed protection component, which enables landowners to establish, maintain, renovate and/or restore riparian areas and/or forest wetlands and watersheds.
- Tennessee's voluntary forestry BMP program is proving to be very effective in protecting the state's water resources.
  - Periodic BMP surveys are valuable in providing a measure of forestry BMP implementation and identifying needed BMP program improvement.
  - A recent BMP survey of timber harvesting sites across Tennessee showed that BMPs were correctly implemented in 81.9 percent of the situations requiring forestry BMPs, which is an increase of 30 percent from the 1996 survey. The new protocols established for the survey will allow the division to better identify areas to intensify educational efforts. (Clatterbuck, 2004)
- Tennessee Master Logger program is successful in educating loggers, landowners, and forestry professionals on forest ecology, management, silviculture, and forestry BMPs.



(Data source: Tennessee Forestry Association)

## The Forestry Commission Recommendations:

1. *Protecting Tennessee's water resources through pro-active harvest site visits is an important role of the Division of Forestry. Currently, the division employs one full time water quality specialist responsible for providing technical assistance in forestry BMP implementation. **It is recommended the division seek federal or state funding for two additional full time positions for water quality foresters to increase the state's ability to assist with implementation of forestry BMPs.***

The primary responsibility of the division's water quality forester is to provide educational opportunities around the state for both landowners and the forestry community. Additional water quality foresters would allow the division to be more proactive in providing courtesy exams of timber harvesting operations. Courtesy exams can be very specific in identifying potential water quality problems and applicable corrective actions. Such an approach allows more one-on-one interaction with loggers/operators and addresses specific forestry BMP implementation issues. The forester providing the courtesy exam could record their findings and report them monthly, which will allow the division to see where additional educational activities need to be focused to improve forestry BMP implementation.

These water quality foresters will need to be highly skilled and specially trained to properly evaluate water quality problems consistently across the state. These highly trained individuals will then provide training opportunities for landowners, loggers, and forestry professionals in forestry BMP implementation.

2. *The division is currently working under a memorandum of understanding with TDEC to investigate water quality complaints associated with harvesting operations. At this time, the division does not have the authority to investigate sites without permission from the landowner. **It is recommended the Department of Agriculture seek an amendment to the Tennessee Code Annotated to include authorization for employees to go upon any land for the purpose of investigating forestry BMP implementation and water quality complaints.***

Current law (11-4-406 of the T.C.A.) reads: "*The division, through its authorized employees and agents, may, at any time, go upon any land within this state for the purpose of investigating, preventing, or controlling forest, woods, brush or grass fires of any nature, or to take other action necessary for the control of forest disease, insects, and other pests without incurring liability for trespassing*". The Forestry Commission believes the division should have the authority to visit harvesting operations for assessing forestry BMP implementation and/or investigating water quality complaints. Such authority will assist the division with fulfilling their obligations to TDEC and their role of protecting water quality while promoting proper silvicultural practices.

3. *Tennessee's municipal water sources can benefit from the proper management of urban forest resources. **It is recommended division foresters work closely with municipal planning departments to promote the use of trees as a vegetative solution to reduce peak flooding and control stormwater runoff.***

Trees are a crucial component to a municipality's infrastructure and they are becoming more important with new environmental requirements. Many of Tennessee's municipalities are developing strategies to handle stormwater runoff to meet the National Pollutant Discharge Elimination System permit program authorized by the Clean Water Act, which is federally regulated by the Environmental Protection Agency. Trees can help slow the flow of runoff and allow time for the soil and roots to absorb water, in contrast to impervious surfaces found in developed areas.

Division employees need to assist municipalities in developing and implementing vegetative solutions for stormwater problems. According to a study done by American Forest in Knox County, the total stormwater retention capacity of their urban forest is 744 million cubic feet. American Forest translates this number to mean that the urban forest has a stormwater management asset value of \$1.48 billion for Knox County. (American Forests, 2003)

4. ***It is recommended the division cooperate with Tennessee Forestry Association in developing a procedure to inform wood buyers/receivers about the delivery of wood from a logger/operator who is not properly implementing forestry BMPs.***

In the past, the division's water quality forester has been successful in resolving troublesome water quality situations by suggesting to buyers/receivers that they temporarily stop receiving wood from specific harvest sites. Informing buyers/receivers has proven to be successful and timely in resolving potential troublesome situations. An established procedure of informing wood buyers/receivers of poor performance by loggers/operators should enhance the division's program effectiveness.

5. *Evaluating forestry BMP implementation rates provide a measure of the effectiveness of past BMP educational efforts. **It is recommended the division continue to evaluate the proper use of forestry BMPs by setting specific performance goals and reporting implementation survey findings on a three-year basis.***

The evaluation should follow guidelines established by the Southern Group of State Foresters to allow cross-state comparisons and to maintain a methodology employing statistically sound practices. The guidelines require the evaluator to "judge whether each applicable practice was implemented properly and completely and whether a risk to water quality exists as a result of noncompliance" (SFRA, 525).

# **Appendix**

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**House Joint Resolution 189**

**Insect & Disease Concerns for Tennessee**

**Timber Resources Discussion**

# House Joint Resolution 189

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By Garrett

A RESOLUTION directing the Forestry Commission to evaluate the Southern Forest Resource Assessment relative to forest resource issues in Tennessee.

WHEREAS, the Southern Forest Resource Assessment (SFRA) was initiated in May of 1999, for the purpose of examining the status, trends, and potential future of Southern forests; and

WHEREAS, the SFRA was a joint project of the U.S. Forest Service, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency, Tennessee Valley Authority, and Southern States forestry, fish, and wildlife agencies; and

WHEREAS, the SFRA included the involvement of 25 research scientists, 100 peer reviewers, and comprehensive public participation to develop a thorough description for forest conditions and trends in the South; and

WHEREAS, the SFRA, as completed and published in January of 2003, specifically examined a wide range of forest sustainability issues including urbanization, timber harvesting, chip mills, forest pests, and climatic change; and

WHEREAS, the SFRA contains extensive findings regarding forest resource conditions in Tennessee, including the following significant conclusions:

1. The most significant factor influencing forest sustainability in Tennessee is the loss of forest land to urbanization, notably in Central Tennessee.
2. Chip mill technology does not threaten future timber supplies or forest health but may cause local structural change to forests and influence local economies.
3. Tennessee will experience large percentage increases in timber production with softwood growth and removal projected to be equal by 2035.
4. Insect and disease infestations will be recurring problems in the absence of adequate management activities in pine stands and sustained efforts to monitor and control Gypsy moth and oak decline in hardwood forests.
5. Demand will increase for a broad range of multiple resource benefits as access to private forest land decreases.
6. Total pine (natural, mixed, and planted) acreage in 1999 (1.5 million acres) is less than total pine acreage in 1952 (1.8 million acres).

7. Planted pine amounts to only 3 percent of the total timberland in Tennessee, but the area of pine plantations is expected to increase from 458,000 acres in 1999 to approximately 1 million acres by 2040.
8. Hardwood and natural mixed hardwood forests comprise 90 percent of the forests in Tennessee (12.4 million acres) and are expected to decline to about 10 million acres by 2040.
9. Loss and fragmentation of forest land will impact certain wildlife, particularly Neotropical migrant bird species.
10. Silviculture ranks last among twelve sources of impairment to rivers and streams. and

WHEREAS, the findings in the SFRA have important implications for the development of public policy priorities, initiatives, and direction; and

WHEREAS, the Tennessee Forestry Commission as established in Tennessee Code Annotated Title 11, Chapter 4, Part 2, has the responsibility to (1) formulate and recommend State forestry policies to the Governor; (2) recommend to the General Assembly legislation to protect, conserve, and develop the forest resources of the State; and (3) establish State forestry policies which will enable the Division of Forestry to manage and maintain programs of fire protection, forest pest management, reforestation, landowner assistance, utilization, marketing, communications, education, and information and management of state-owned forests; now, therefore,

BE IT RESOLVED BY THE HOUSE OF REPRESENTATIVES OF THE ONE HUNDRED THIRD GENERAL ASSEMBLY OF THE STATE OF TENNESSEE, THE SENATE CONCURRING, that the Tennessee Forestry Commission, in cooperation with the Department of Agriculture, shall evaluate the Southern Forest Resource Assessment relative to forest resource issues in Tennessee and develop a report containing findings and conclusions of that evaluation. The report will recommend adjustments and/or initiatives in policies and programs of the Division of Forestry, as well as legislation, as may be appropriate to address such issues.

BE IT FURTHER RESOLVED, that the Forestry Commission shall provide opportunities for public participation in its evaluation of the SFRA, including, but not limited to, specific efforts to incorporate input from organizations actively involved in forest resource management issues in Tennessee.

BE IT FURTHER RESOLVED, that the Forestry Commission shall seek assistance and input from other State and Federal government agencies involved in forest resource management programs, including, but not limited to, the Tennessee Wildlife Resources Agency; the University of Tennessee Agricultural Extension Service; the University of Tennessee Department of Forestry, Wildlife, and Fisheries; the United States Forest Service; the United States Environmental Protection Agency; and the United States Fish and Wildlife Service.

BE IT FURTHER RESOLVED, that the Forestry Commission and the Department of Agriculture are urged to submit their findings and recommendations relative to the SFRA by January 31, 2004, to the Governor, as well as the Chairs of the following committees of the General Assembly: Senate Commerce, Labor and Agriculture Committee, Senate Environment, Conservation and Tourism Committee, House Conservation and Environment Committee, and House Agriculture Committee; provided, however the Forestry Commission and the Department of Agriculture shall submit their findings and recommendations relative to the SFRA to the aforementioned parties no later than March 1, 2004.

BE IT FURTHER RESOLVED, that an enrolled copy of this resolution be transmitted to the Tennessee Forestry Commission and the Commissioner of Agriculture.

# Insect & Disease Concerns for Tennessee

The SFRA lists the following insects and diseases as concerns for Tennessee:

## Nonnative Diseases

### ➤ *Beech Bark Disease*

This disease is expected to permanently reduce the American beech from the canopy of Tennessee's forest and reduce it to an understory or mid-story tree if no natural controls are found. Resistant beech trees do exist, as well as a natural insect predator and a mycoparasite of the disease but it is still anticipated that there will be high mortality rates and deformation of beech trees throughout the South. (SFRA, 403 & 416-7)

### ➤ *Butternut Canker*

Butternut is a small to medium size tree that is found in a significant portion of Tennessee in riparian areas. The disease features a highly aggressive fungus that is rapidly spreading. The number of butternut trees has been so drastically reduced that it is now a candidate for listing under the Endangered Species Act. Since butternut comprises less than .5 percent of the trees in the South, its loss will have a minor impact on Tennessee's forest ecosystem according to many participating in the SFRA. (SFRA, 417-8)

### ➤ *Dogwood Anthracnose*

This small flowering understory tree is declining at a significant rate due to an introduced fungus. This disease in the eastern half of the state has impacted both landscape and forested trees. Dogwood is an abundant source of soft mast for hundreds of wildlife species. The tree is extremely popular in the landscape trade and its use is declining, as the disease becomes more predominant. Disease-free trees were introduced into the market place in the fall of 2000. (SFRA, 416)

## Native Disease

### ➤ *Oak Decline*

Oak decline is triggered when older dominant oaks on dry sites with rocky, shallow soil undergoes environmental stress which cause root dieback. Both insects and diseases then attack these stressed trees. Both bottomland and upland hardwoods are affected and red oaks are more susceptible than white oaks. Forests in Tennessee have the highest incidence of oak decline after Virginia and North Carolina. "The relative importance of oak is both a biological and a social question, but the cumulative impacts of the loss of the American chestnut, continued oak decline and the ongoing defoliation by the gypsy moth indicate that special efforts must be made if the oaks are to maintain their prominence in the forest." (SFRA, 410)



## Nonnative Insects

### ➤ *Hemlock Woolly Adelgid*

Introduced in the 1950s from Asia, the adelgid currently threatens both the eastern and Carolina hemlock of eastern Tennessee. The eastern hemlock is a significant component of riparian ecosystems; it moderates stream water temperatures through its dense shade and provides nutrients through leaf litter and shelter for wildlife. Currently, biocontrol techniques are being used on the adelgid with some success in reducing insect populations. Whether or not biocontrol translates into reduced mortality remains to be seen. There are insecticide options but they are not practical for forested situations. The SFRA states, "It appears that all untreated hemlocks...could eventually be killed by the adelgid." (SFRA, 418-9)

### ➤ *Gypsy Moth*

The gypsy moth was introduced from France in 1869. It is currently spreading across the eastern United States. In 2009, the front of the gypsy moth is expected to enter the northeastern portion of the state from Virginia. Caterpillars of this moth defoliate both forest and urban shade trees. This pest is not very selective in what trees it eats but it prefers oaks, basswood, willow and sweetgum. There are three strategies being used in the management of gypsy moths: eradication, suppression, and slowing the spread. Tennessee is currently employing the eradication strategy of gypsy moth management. (SFRA, 419-420)

## Native Insect

### ➤ *Southern Pine Beetle*

The southern pine beetle is the most destructive insect of the southern pine forests. It has cycles of periodic outbreaks, which kill large numbers of pine trees. The eastern part of Tennessee has recently undergone such an outbreak. Cold winter temperatures and natural enemies of the beetle normally keep their populations low. However, they have little effect when pine stands that are too thick or too old on low quality sites stressed by unfavorable growing conditions. (SFRA, 410-412)

# Timber Resources Discussion

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Chapter 13 of the SFRA goes into a lengthy discussion about the South being the wood basket for the world and about the future of pine plantations. The chapter's co-author, Dr. Robert Abt (Professor—Expertise in Forest Economics and Management, Department of Forestry North Carolina State University) and others developed the Subregional Timber Supply Model to project the future of the timber resources and timber markets in the south to determine if the South could sustain the high demand of wood from the forest resources.

The model uses four different scenarios for the period of 1995 to 2040: IH = inelastic timber demand and high plantation volume growth rates, IL = inelastic timber demand and low plantation volume growth rates, EH = elastic timber demand and high plantation volume growth rates, and EL = elastic timber demand and low plantation volume growth rates. The authors note that the “reliability of such a projection becomes progressively lower as the time projected into the future increases.” The co-author also noted that Tennessee lies on the outer perimeter of the models projected range, which means the model is not as reliable as if Tennessee were in the center of the model.

According to the models in the SFRA, Tennessee will see the greatest pine plantation increase amongst the southern states. It is projected that the number of pine plantations will increase by 120 percent. The forecast is based on a land use model, which assumes high demand for pine and therefore high pine prices.

The Forestry Commission along with the public had some concern over how the numbers were derived and/or what the projected increase in acreage of pine plantations means to Tennessee. In order to better understand the projections in the SFRA, the Forestry Commission invited Dr. Abt to meet with the sub-committee and the Division of Forestry. The meeting with Dr. Abt provided a better understanding of the future projections.

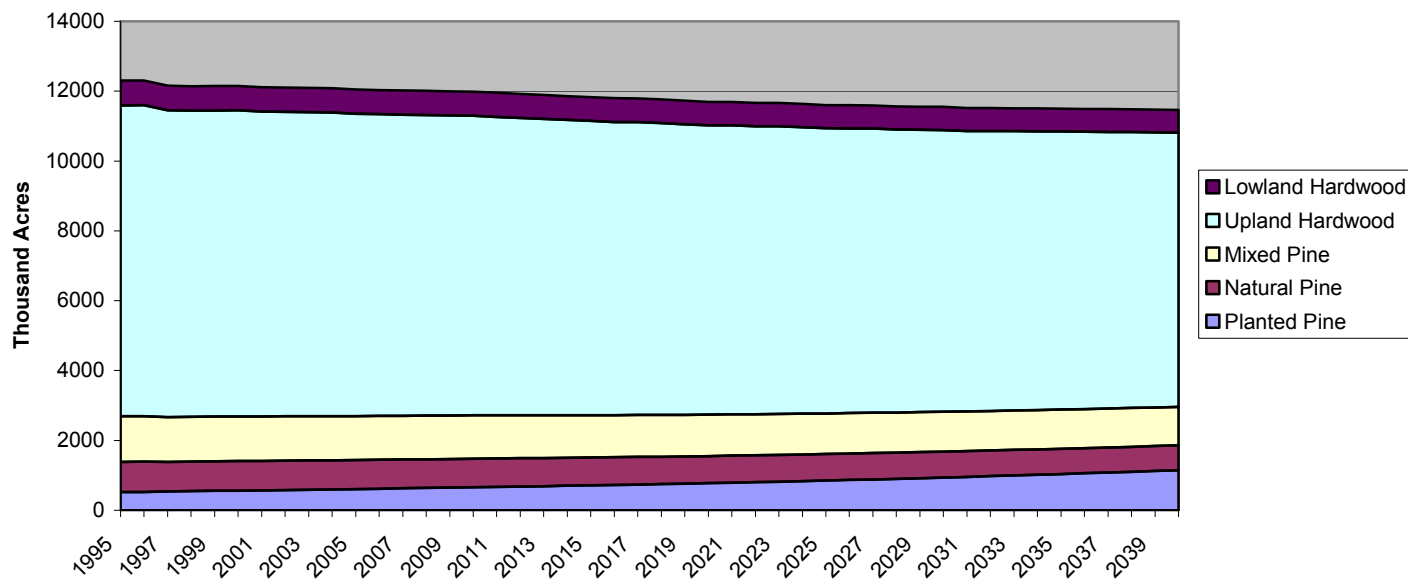
The Commission learned that the results published in the SFRA are based on the IH situation, which is a high demand situation where market demand was high for softwoods and results in an increase in acres of pine plantations and that acreage for pine plantation is planted on high growth potential land. In 2040 under the IH situation Tennessee would have 1,008,480 acres of pine plantation. In other models that have a different demand structure, the acreage of pine plantations would be lower.

Other key points that the Commission learned about the models are they look at past trends that may not continue into the future. The Commission believes the increase in pine plantations will not be as high as predicted in the SFRA. The models utilized did not account for the current trend of forest industry land being sold, the increase of volume growth per acre due to genetics, the impacts and increase in the use of recycled paper, and the southern pine beetle. Furthermore, the timber market is going to fluctuate and may not remain at the high demand level. As stated in the forest fragmentation section, forest industry has sold off 617,000 acres over the past 5 years. The Forestry Commission feels that the timber market is going to encounter unpredictable changes and the market may not be at a high demand level for 40 years.

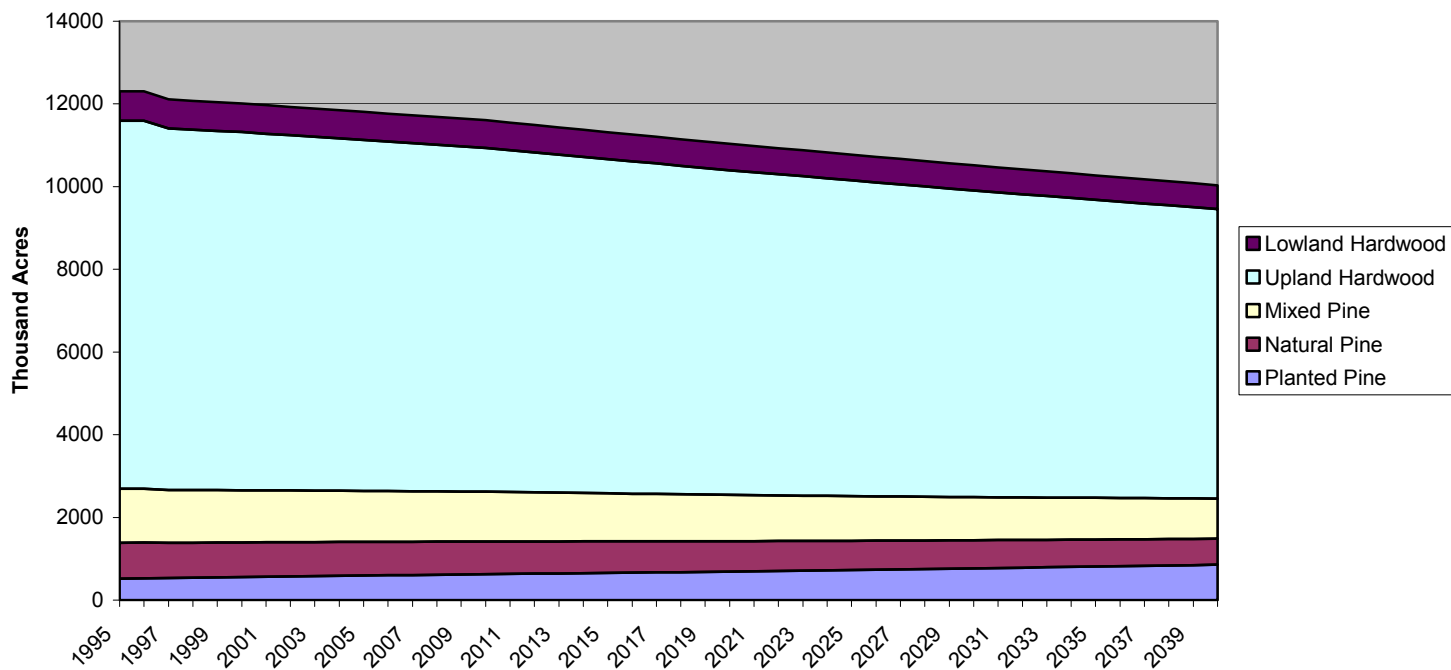
When reviewing the Tennessee Private Timberland Charts and the Representation of Tennessee's Land Acreage Charts (page 21), the Forestry Commission found their greatest concern. The Commission is concerned with the amount of forest land that is being urbanized or categorized in other lands. The high demand scenario will have a 7 percent decrease in forest land and the low demand scenario will have a greater forest loss of 10.6 percent.

(Abt, 2004)

### Tennessee Private Timberland Baseline High Demand



### Tennessee Private Timberland Baseline Low Price



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***Tennessee Department of Agriculture, Authorization No. 325332, 120 copies, February 2004.  
This public document was promulgated at a cost of \$1.74 per copy.***